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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Jeffrey Bernard Fortin et al.

Serial No.: 10/666,180

Filed: September 17, 2003

For: GAS FLOW CONTROL FOR GAS
BURNERS UTILIZING A MICRO-
ELECTRO-MECHANICAL VALVE

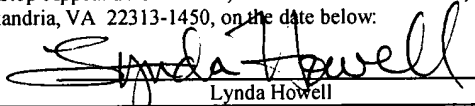
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Group Art Unit: 3749

Examiner: Alfred Basichas

Atty. Docket: 131200-1/YOD
GERD:0379

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Date	Lynda Howell

APPEAL BRIEF PURSUANT TO 37 C.F.R. §§ 41.31 AND 41.37

This Appeal Brief is being filed in furtherance to the Notice of Appeal mailed on April 26, 2005, and received by the Patent Office on April 29, 2005.

The Commissioner is authorized to charge the requisite fee of \$500.00, and any additional fees which may be necessary to advance prosecution of the present application, to Account No. 07-0868, Order No. 131200-1/YOD (GERD:0379).

1. **REAL PARTY IN INTEREST**

The real party in interest is General Electric Company, the Assignee of the above-referenced application by virtue of the Assignment to General Electric Company by Jeffrey Bernard Fortin, Warren Frank Bessler, Joel Meier Haynes and Charles Erklin Seeley recorded at reel 014537, frame 0076, and dated September 17, 2003.

Accordingly, General Electric Company, as the parent company of the Assignee of the

above-referenced application, will be directly affected by the Board's decision in the pending appeal.

2. **RELATED APPEALS AND INTERFERENCES**

Appellants are unaware of any other appeals or interferences related to this Appeal. The undersigned is Appellants' legal representative in this Appeal.

3. **STATUS OF CLAIMS**

Claims 1-10 and 12-23 are currently pending, are currently under final rejection and, thus, are the subject of this Appeal.

4. **STATUS OF AMENDMENTS**

The Appellants have not submitted any amendments subsequent to the Final Office Action mailed on January 26, 2005.

5. **SUMMARY OF CLAIMED SUBJECT MATTER**

The present invention relates generally to the field of cooking appliances. *See* Application, page 1, paragraph 001. More particularly, in certain embodiments, the invention relates to a micro-electro-mechanical (MEMS) valve for providing a variable gas flow control for gas burners. *See id.* The invention also relates to provision of such valves in parallel with one another, and to the independent control of such valves.

The Application contains four independent claims, namely, claims 1, 10, 17 and 19, all of which are the subject of this Appeal. The subject matter of these claims is summarized below.

With regard to the aspect of the invention set forth in independent claim 1, discussions of the recited features of claim 1 can be found at least in the below cited locations of the specification and drawings. By way of example, an embodiment in accordance with the present invention relates to an electronically controlled gas burner

system (e.g., 10) comprising at least one gas burner (e.g., 14) and a micro-electro-mechanical system (MEMS) valve (e.g., 12) comprising a plurality of microvalves (e.g., 16) in fluid communication with the gas burner. *See, e.g., id.* at page 2, paragraph 008; *see also* FIGS 1-3. The gas burner system also includes a microwave controller (e.g., 18) for controlling the opening of each of the microvalves in the micro-electro-mechanical valve. *See, e.g., id.* at page 2, paragraph 008; *see also e.g., id.* at page 5, paragraphs 014-015.

With regard to the aspect of the invention set forth in independent claim 10, discussions of the recited features of claim 10 can be found at least in the below cited locations of the specification and drawings. By way of example, an embodiment in accordance with the present invention relates to an electronically controlled gas burner system (e.g., 10) comprising at least one gas burner (e.g., 14) and a micro-electro-mechanical valve (e.g., 12) comprising a plurality of independently controllable microvalves (e.g., 16) in parallel fluid communication with the gas burner. *See, e.g., id.* at page 2, paragraph 008; *see also* FIGS. 1-3.

With regard to the aspect of the invention set forth in independent claim 17, discussions of the recited features of claim 17 can be found at least in the below cited locations of the specification and drawings. By way of example, an embodiment in accordance with the present invention relates to a gas valve (e.g., 12) comprising a plurality of microvalves (e.g., 16) in parallel fluid communication with a gas burner (e.g., 14) of a cooking appliance. *See, e.g., id.* at page 2, paragraph 008; *see also* FIGS. 1-3.

With regard to the aspect of the invention set forth in independent claim 19, discussions of the recited features of claim 19 can be found at least in the below cited locations of the specification and drawings. By way of example, an embodiment in accordance with the present invention relates to a method for controlling gas flow to a gas burner (e.g., 14). The method comprises issuing a command for a desired gas flow and controlling opening of at least some of a plurality of independently controllable

microvalves (e.g., 16) in parallel fluid communication to provide the desired gas flow corresponding to the command. *See, e.g., id.* at pages 3-4, paragraph 010.

A benefit of the invention, as recited in these claims, is the ability to control gas flow to a burner by controlling opening of at least some of a plurality of independently controllable microvalves in parallel fluid communication. As described in the specification, each of these microvalves may be independently controlled to open or close the microvalves, allowing gas to flow from the gas supply to the burner at a desired rate. *See, e.g., id.* at page 3, paragraph 008.

This is a clear difference and distinction from the prior art, as discussed below.

6. **GROUND OF REJECTION TO BE REVIEWED ON APPEAL**

Sole Ground of Rejection for Review on Appeal:

All of the claims stand rejected under 35 U.S.C. § 103(a) as being obvious in view of U.S. Patent No. 4,770,161 to Charron (hereafter “Charron”). Accordingly, Appellants respectfully urge the Board to review and reverse the rejection.

7. **ARGUMENT**

As discussed in detail below, the Examiner has improperly rejected the pending claims. Further, the Examiner has misapplied long-standing and binding legal precedents and principles in rejecting the claims under Section 103. Accordingly, Appellants respectfully request full and favorable consideration by the Board, as Appellants strongly believe that claims 1-10 and 12-23 are currently in condition for allowance.

A. **Brief Summary of the Rejections:**

The Examiner rejected claims 1-10 and 12-23 under 35 U.S.C. § 103(a) as being unpatentable over Charron. While the Examiner rejected each of independent claims 1, 10, 17, and 19 on the basis of Charron, each of these independent claims will be discussed separately below. Appellants respectfully traverse this rejection.

1. **Judicial precedent has clearly established a legal standard for a *prima facie* obviousness rejection.**

In accordance with MPEP § 2142, the initial burden is on the Examiner to provide some suggestion of the desirability of doing what the inventor has done. “To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the Examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.” *Ex parte Clapp*, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. & Inter. 1985).

2. **The Examiner’s rejection of independent claims 1, 10, 17 and 19 is improper because the rejection fails to establish a *prima facie* case of obviousness.**

Independent claim 1 recites:

An electronically controlled gas burner system comprising:
at least one gas burner;
a micro-electro-mechanical valve comprising *a plurality of microvalves in parallel fluid communication* with the gas burner; and
a microwave controller for controlling the opening of each of the microvalves in the micro-electro-mechanical valve. (Emphasis Added)

Independent claim 10 recites:

An electronically controlled gas burner system comprising:
at least one gas burner; and
a micro-electro-mechanical valve comprising *a plurality of independently controllable microvalves in parallel fluid communication with the gas burner*. (Emphasis Added)

Independent claim 17 recites:

A gas valve comprising a plurality of microvalves *in parallel fluid communication* with a gas burner of a cooking valves. (Emphasis Added)

Independent claim 19 recites:

A method for controlling gas flow to a gas burner comprising:
issuing a command for a desired gas flow; and
controlling opening of at least some of *a plurality of independently controllable microvalves in parallel fluid communication* to provide the desired gas flow corresponding to the command. (Emphasis Added)

a. Charron fails to teach use of a plurality of microvalves in parallel fluid communication with a gas burner.

First, Charron does not disclose or suggest use of a plurality of microvalves in parallel fluid communication with a gas burner. As noted above, the Examiner asserted that it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the claimed arrangement into the invention disclosed by Charron, so as to provide for enhanced control for fuel flow and combustion.

As stated in the specification of the present application, the plurality of microvalves are arranged in an array and are in parallel fluid communication with the gas burner to provide improved electronic control of gas burner. *See, e.g., id.* at page 3, paragraph 009. Accordingly, different numbers of microvalves may be opened or closed to provide variable gas flow to a *single* gas burner. *See, e.g., id.* at page 3, paragraph 010.

Moreover, the above mentioned arrangement is also employed for a multiburner appliance comprising a MEMS valve having portions of an array of microvalves coupled to respective burners. Again, each portion may include an appropriate number of microvalves to provide a gas flow required to fire the respective burner coupled to each portion.

Charron does not teach providing an array of a plurality of independently controllable microvalves in parallel fluid communication with a single gas burner.

Indeed, the Examiner admitted that this is missing from Charron. Further, Charron does not teach an arrangement with portions of an array of microvalves coupled to respective burners for a multiburner appliance. Rather, Charron teaches intake of a fuel gas to a burner being controlled successively by a gas valve mounted on a rod connected to the center of a membrane, and then by a differential pneumatic valve. *See, e.g.*, at col.3, lines 1-4; *see also* FIG. 1. Further, Charron teaches the control of intake of gas to a main pilot light through a second gas valve. *See, e.g., id.* at col.3, lines 5-7; *see also* FIG. 1.

Further, the Examiner's assertion that such arrangement is within the general skill of one of ordinary skill in the art is completely without basis. Appellants assert that those skilled in the art would simply never incorporate such arrangement into the system disclosed by Charron. In addition, the Examiner has provided no evidentiary support that the features discussed by the Examiner are within the general skill of one of ordinary skill in the art or of "common knowledge". For at least this reason, the Appellants respectfully request that the Board overturn the Examiner's rejections of claims 1, 10, 17 and 19, as well as the claims that depend therefrom.

b. Charron does not suggest independent control of gas flow to a gas burner via a plurality of microvalves in parallel fluid communication with the gas burner.

As noted above, Charron does not teach the use of plurality of microvalves in parallel fluid communication with the gas burner. Moreover, Charron does not suggest independent control of the plurality of valves to control gas flow to the gas burner.

As stated in the specification of the current application, the invention uses the plurality of microvalves in parallel fluid communication to control the gas flow through a microwave controller. *See, e.g., id.* at page 3, paragraph 010. Further, the microvalves may be opened in a continuously variable, or analog fashion to provide a variable range of microvalve openings, and consequently, variable gas flow from the valve, depending on a degree of opening of the microvalve. In addition, different numbers of microvalves

in the assembly may be opened or closed to provide variable gas flow. *See, e.g., id.* at page 4, paragraph 010 and at page 6, paragraph 016.

Charron fails to teach such arrangement for controlling the gas flow to the burner. Indeed, here again the Examiner admitted as much. The Examiner asserted that it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the claimed arrangement into the invention disclosed by Charron, so as to provide for enhanced control of fuel flow and combustion because it is within the general skill of one of ordinary skill in the art to select a known structure on the basis of its suitability for the intended use.

The Appellants have noted above that Charron discloses neither use of plurality of microvalves (or any valves) in parallel fluid communication with the gas burner. Logically, Charron then simply cannot and does not disclose control of gas flow to the burner through the plurality of microvalves.

Indeed, the vast majority of the Examiner's rejections are based not on explicit disclosures within the cited reference but merely on the Examiner's unsupported opinion. Because there has been no showing by the Examiner that the above-recited features are present or desirable in Charron, the modifications suggested by the Examiner are hardly obvious. Accordingly, no *prima facie* case of obviousness exists with regard to claims 1, 10, 17 and 19. As such, the Appellants respectfully request that the Board direct the Examiner to allow the claims 1, 10, 17 and 19 and the claims that depend therefrom.

c. Examiner's use of Official Notice is improper.

In rejecting independent claims 1, 10, 17 and 19, the Examiner asserted that Charron discloses substantially all of the recited features except that Charron does not recite a plurality of burners or a plurality of independently controllable valves in parallel. *Appellants note that these are the precise features, which Appellants would have the*

Board observe as clearly supporting an allowance. In an attempt to cure the deficiencies, the Examiner used Official Notice to reject claims 1, 10, 17 and 19. The Examiner asserted that such an arrangement of valves and burners is old and well known in the art. In fact, the Examiner has not presented any evidence that supports such features being within the general skill in the art or of “common knowledge”. For at least this reason, Appellants respectfully request that the Board overturn the Examiner’s rejections of claims 1, 10, 17 and 19.

In the Advisory Action mailed on April 13, 2005, the Examiner argued that Appellant’s position regarding opposition to his use of Official Notice was baseless. In particular, the Examiner argued that Official Notice had been used in the first, non-final Office Action and had not then been challenged.

While that statement alone is true, it is critical to note that the Examiner initially used Official Notice for a completely different reason. The Examiner only used Official Notice initially to reject dependent claim 8 and independent claim 17. Claim 17 was subsequently amended to add that the valves are in parallel. This feature has not and could not have been the subject of Official Notice in the first Office Action.

In the Advisory Action , the Examiner argued that:

The first Office Action mailed 9/11/04 included two instances in which Official Notice was used. Applicant’s reply received 12/6/04 made absolutely no mention of the taking by the examiner of official notice, let alone a traversal. Accordingly, as applicant failed to traverse it, the subject matter to which the official notice referred to has been taken to be admitted prior art. The first mention of any challenge or traversal of the examiner’s use of official notice was only made in the response to the final rejection (from which point prosecution on the merits is closed) received 3/25/05. Nevertheless, this traversal is inadequate, not to mention late. Applicant simply makes a general allegation that the claims define a patentable invention without any reference to the examiner’s assertion of official notice, other than asserting that no evidence was provided to

substantiate it. No evidence was provided to substantiate it, because applicant failed to traverse it at all, let alone adequately. As regards the third instance of official notice, applicant traverses the use of official notice, but fails to specifically point out the supposed errors in the examiner's action, other than asserting that no evidence was provided to substantiate it. (*See* Advisory Action, page 2)

Clearly, the Examiner's later use of Official Notice, unrelated to the initial use, is unfounded. The Appellants could not possibly have commented earlier on its use in new rejections of features not even recited in the claims later amended.

Appellants also note that Official Notice simply cannot be used to supply elements altogether missing from the cited art. Thus, the Examiner's insistence on evidence to refute the use of Official Notice is misplaced. Appellants do not, and indeed cannot simply rebut the Examiner's position. They submit rather that the Examiner has no position. The Examiner would use conjecture alone to supply the very elements missing from the only reference relied upon. Such is not the policy or practice of Official Notice.

Appellants would ask the Board to reverse on this point as well.

Conclusion

Appellants respectfully submit that all pending claims are in condition for allowance. However, if the Examiner or Board wishes to resolve any other issues by way of a telephone conference, the Examiner or Board is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,

Date: June 15, 2005



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8. **APPENDIX OF CLAIMS ON APPEAL**

Listing of Claims:

1. (previously presented) An electronically controlled gas burner system comprising:

at least one gas burner;

a micro-electro-mechanical valve comprising a plurality of microvalves in parallel fluid communication with the gas burner; and

a microvalve controller for controlling the opening of each of the microvalves in the micro-electro-mechanical valve.

2. (original) The system of claim 1, wherein the micro-electro-mechanical valve is positioned remote from the gas burner.

3. (original) The system of claim 1, wherein the micro-electro-mechanical valve is positioned within the gas burner.

4. (original) The system of claim 1, wherein the micro-electro-mechanical valve is coupled to a plurality of gas burners.

5. (original) The system of claim 4, wherein a portion of the plurality of microvalves in the micro-electro-mechanical valve is coupled to a respective one of the plurality of gas burners.

6. (original) The system of claim 1, wherein the microvalve controller further comprises a module to selectively control an opening of each of the microvalves for controlling a gas output.

7. (original) The system of claim 1, wherein the module comprises a pulse width modulator.

8. (original) The system of claim 1, wherein the microvalve controller is further coupled to an electronic interface programmable by a user.

9. (original) The system of claim 1, wherein the microvalve controller is further coupled to a sensor positioned proximate the burner.

10. (previously presented) An electronically controlled gas burner system comprising:

at least one gas burner; and

a micro-electro-mechanical valve comprising a plurality of independently controllable microvalves in parallel fluid communication with the gas burner.

11. (canceled)

12. (previously presented) The gas burner of claim 10, further comprising a microvalve controller for controlling an opening of each of the microvalves.

13. (previously presented) The gas burner of claim 12, wherein each of the microvalves is configured to contribute to a flame when opened by the microvalve controller.

14. (original) The gas burner of claim 12, wherein the microvalve controller further comprises a pulse width modulator to modulate the opening of each of the microvalves for controlling a gas output.

15. (original) The gas burner of claim 14, wherein the pulse width modulator operates at duty cycle in the range of between 90% and 10%.

16. (original) The gas burner of claim 15, wherein the pulse width modulator operates at duty cycle in the range of between 60% and 40%.

17. (previously presented) A gas valve comprising a plurality of microvalves in parallel fluid communication with a gas burner of a cooking appliance.

18. (original) The gas valve of claim 17, further comprising a microvalve controller for controlling the opening of each of the microvalves.

19. (previously presented) A method for controlling gas flow to a gas burner comprising:

issuing a command for a desired gas flow; and

controlling opening of at least some of a plurality of independently controllable microvalves in parallel fluid communication to provide the desired gas flow corresponding to the command.

20. (previously presented). The method of claim 19, further comprising allocating a portion of the plurality of microvalves to a respective burner of a multiburner appliance.

21. (original) The method of claim 19, wherein controlling an opening of each of the microvalves comprises driving the microvalve to be fully open.

22. (original) The method of claim 19, further comprising:

issuing a feedback command to adjust the gas flow; and

adjusting the gas flow by changing the opening of at least some of the microvalves.

23. (previously presented) The gas valve of claim 17, wherein the plurality of microvalves are independently controllable.